WAFS In-flight Icing Report 2024/25

Executive Summary

In-flight icing poses a major threat to aviation. Consequently, it is one of the hazards forecast by the World Area Forecast Service (WAFS). Ensuring the accuracy of such forecasts is therefore of high importance. The performance of the WAFS in-flight icing forecasts is assessed during 2024. This includes verification of the routine deterministic icing severity forecasts, as well as the Significant Weather (SigWx) icing forecasts and ensemble trials of icing risk and ProbMOG forecasts.

The results show no significant deviations from previous years. All forecasts show skill at predicting icing severity. However, this varies depending on the metric and threshold chosen. For example, World Area Forecast Centre (WAFC) London forecasts match the areas of interest exceptionally well for low or greater icing and evaluates with little bias. However, they do not match as well for higher severity thresholds and have a lower Probability of Detection than the other WAFC forecasts. It is also notable that both WAFC Washington and WAFC Harmonized forecasts evaluate similarly, despite the WAFC Harmonized forecasts being a blend of both WAFC London and WAFC Washington forecasts.

The SigWx object forecasts appear to not match the regions of interest as well as the other WAFC forecasts. However, where matching occurs, both the position of the objects and the degree of overlapping with the observations is superior.

The ensemble-derived icing risk matrix forecasts give an improvement over the deterministic WAFC London forecasts. This improvement is not sufficiently better than the WAFC Washington or WAFC Harmonized forecasts.

Finally, the ProbMOG forecasts demonstrate both reliability and resolution when forecasting icing. There is little sensitivity to lead time. Whilst the reliability curve shows significant over-forecasting, it is not dissimilar to previous reliability curves when evaluating icing potential in historical reports.